

PM_{2.5} Monitoring to support Air Quality Index Reporting and Forecasting

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Project Goals for PM_{2.5} Monitoring used in AIRNow reporting of the AQI

- Provide monitoring coverage to support areas of interest.
 - The right place
- Provide data of sufficient quality to characterize the air for purposes of public reporting and as an input to forecasting.
 - The right method
- Provide real-time PM_{2.5} monitoring data in a timely manner.
 - The right time

Network Design Elements

- Neighborhood scale or larger
- MSA's of interest
 - Large cities:
 - Monitoring required in MSA's over 1M
 - 36 cities (most over 1M)
 - Areas with high PM2.5
 - Other medium and smaller MSA's
- Rural coverage
 - Need some rural coverage to capture gradients
- Tool's
 - '02 NAQC presentation and guidance on spatial DQO's
 - PM2.5 Network Design Guidance

What is the expected Quality of the PM2.5 continuous monitoring data

- Need to balance describing air quality in a general sense such as AQI color codes with describing it in a very specific sense such as an exact index value of 50
- As a starting point for identifying the expected quality of the data two statistics are suggested as compared to a collocated FRM:
 - method bias of +/-10%
 - Taken from DQOs that apply to NAAQS monitoring.
 - correlation of 0.9 (squared correlation of 0.81)
 - Based on interpretation of “Data Quality Objectives (DQOs) for Relating FRMs and Continuous PM2.5 Measurements to Report an AQI.
- Ultimately, individual agencies need to decide for themselves.

Describing “Timely Manner”

- Report last 1 hour interval as soon as practical
- Goal to report to the Data Management Center (DMC) no later than 20 minutes after the end of the hour
 - QC checks at the DMC
 - Produce data in the “obs” file
 - Generate maps
 - Send data to the various weather service providers and other media outlets
 - Allow for minimum amount of review before displaying public data
- Data reported publicly within an hour
 - Consistent with AQI long range planning goal of turning data around nationally within an hour.

PM Continuous Monitoring Project Updates

- **National Monitoring Strategy and Clean Air Science Advisory Committee (CASAC)**
- **Method Issues**
- **PM_{2.5} Continuous Monitor Deployment**
- **Statistical Guidance, Tools and Support**

National Monitoring Strategy (NMS)

- **CASAC & Continuous Monitoring Implementation Plan**
 - CASAC letter to EPA March 1, 2002 reviewing Revision 1 of Plan
 - Endorsed framework of Plan with minor deviations
 - Requested DQO process on minimum correlation
 - Requested reexamining Federal Equivalent Method (FEM) designation
 - EPA issues Revision 2 of plan on 6/21/02
 - EPA letter to CASAC on 9/12/02
- **Revision 2 of Plan part of National Monitoring Strategy**
 - Available on web: www.epa.gov/ttn/amtic/monitorstrat/sec6.pdf
- **Full NMS open for comment**
- **EPA developing proposed changes to regulatory language**
- **EPA scheduling CASAC review of full NMS this spring**

Method Issues

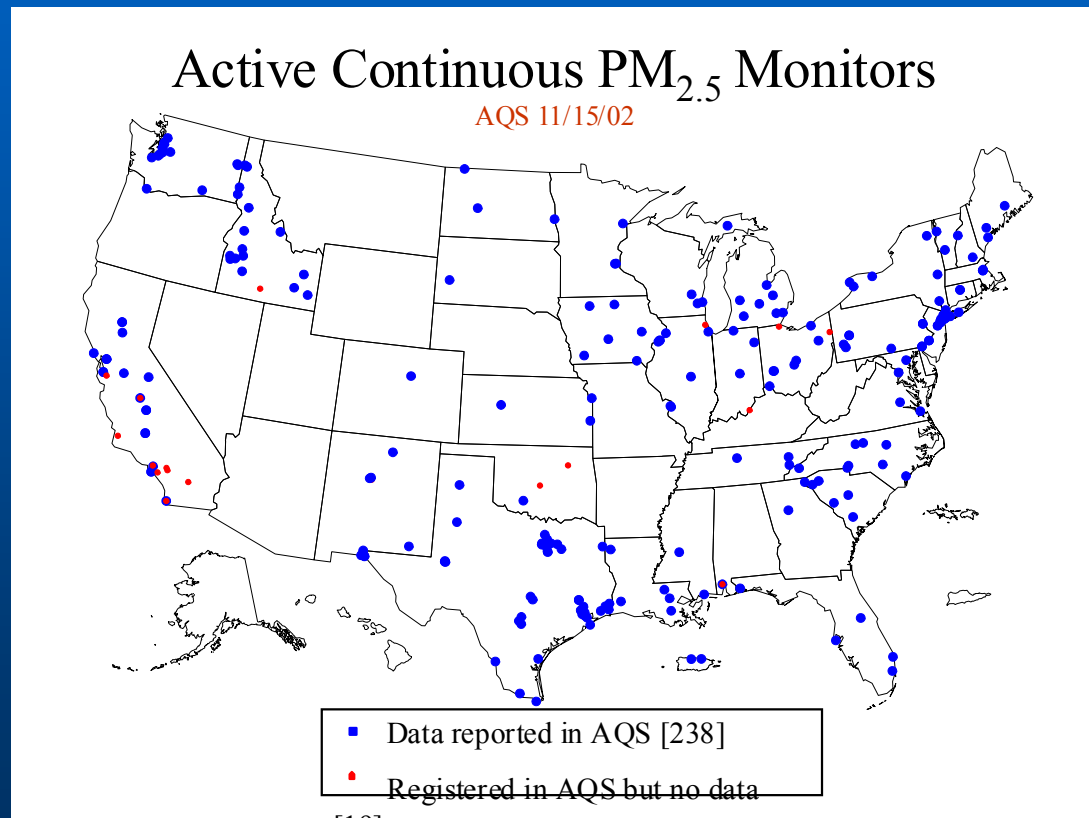
- No FEM PM2.5 continuous monitor
- Very Sharp Cut Cyclone (VSCC) approved as a second stage separator for PM2.5 on 4/2/02
- EPA-ORD pursuing PM coarse (PM10 - PM2.5) Field Study
 - Includes PM continuous methods
- Supersites Program
- Environmental Technology Verification (ETV)

PM Coarse Field Study

- 3 city study designed to investigate potential PM coarse FRM's
 - Gary, IN (Winter)
 - Phoenix, AZ (Spring)
 - Rubidoux, CA (Late Spring or Summer)
- Evaluating:
 - PM10 and PM2.5 FRMs (difference method)
 - Sequential Dichot (using 47 mm filters)
 - Dichot with TEOM (based on approach run at Supersites - runs at higher volume)
 - Beta Attenuation
 - TSI - APS (particle sizer)
- Secondary Objective:
 - PM2.5 continuous instruments

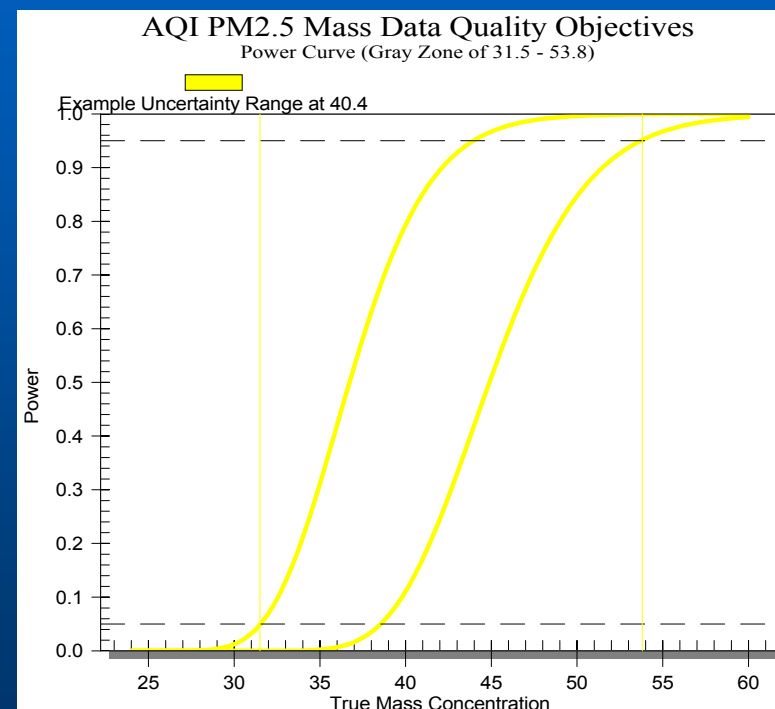
Monitor Deployment

- 231 PM_{2.5} continuous monitoring sites reporting to AIRNow (US and Canada)
- 238+ sites reporting to AQS
- More sites expected in '03
- AIRNow Data Management Center (DMC) accepting PM₁₀ data



Statistical Guidance, Tools and Support

- “Data Quality Objectives (DQOs) for Relating Federal Reference Method (FRM) and Continuous PM_{2.5} Measurements to Report an Air Quality Index (AQI)” EPA-454/B-02-002,
 - Released as a final: November 2002
 - www.epa.gov/ttn/amtic/contmont.html
- DQO Companion Software available on AMTIC under PM_{2.5} QA
 - Includes daily action curves for AQI
- Direct statistical support available for 36 cities that AIRNow is focusing on



Things to think about:

- What does your agency need to make public reporting of PM2.5 continuous data in the AQI a go?
 - the right place
 - the right method
 - the right time
- Is your agency responsible for one of the 36 cities and you would like to get statistical support?

